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# GSM based e-Notice board via SMS using LED display

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**ABSTRACT:** Nowadays where the technology is improved and the world is going mobile many of the ideas have rose in order to make human life easier. This display board makes the day to day life easier. The notice to be given from one place to another place takes sufficient time so this notice board is programmed in order to get the message very faster in some nano seconds. This uses a simple LPC 1114 Microcontroller to store the messages to be displayed on the notice board which is made of 16\*32 LED's per board in the form of HEX values. The MAX 232 level converter is used in order to convert the signals and it acts as a dual driver or a receiver. The message is sent via mobile which is stored in the GSM SIM 900 modem and is displayed on the LED board. The characters are shifted using shift registers.

**KEYWORDS:** LPC 1114, GSM, SIM 900, LED.

## I. INTRODUCTION

In the age of semiconductor domination, LED's have become cheap and popular. The use of LED board in big shops, shopping malls, bus stands, railway stations and educational institutions have become effective way of communication in providing information to the people. The administrator uses a simple GSM handset to send the messages. The display board accommodates 16\*32 LED's in order to display the message in HEX values.

This paper gives the implementation between a mobile and a display board. The message is sent via mobile which is stored in the GSM SIM 900 modem. By receiving proper AT command the message is stored in the Microcontroller. This message is scrolled on the LED panel by means of Shift registers. This kind of notice boards is essentially used in public places where the information is exchanged in a very less time.

## II. PROBLEM STATEMENT

We have seen in the number of places that exchanging information from one another through wireless communication is very much essential. It plays a very important role in schools and colleges. Due to the distance problems one cannot be able to contact large number of peoples in a small amount of time. Where in the railway stations it is not possible to connect PC's and exchange information all the time. LED display notice board is one of the possible solutions to minimize these issues.

Advantages of this proposed system

- Reduction of manpower
- Affordable equipments
- Less time consuming process.
- Can be installed anywhere, where the requirement is more.

**III. SYSTEM OVERVIEW****A.COMPONENTS REQUIRED**

**Microcontroller LPC 1114:** This is a 32-bit ARM processor core. Internally each microcontroller consists of static RAM memory, flash memory, debugging interface and various peripherals. The message to be displayed is stored in this particular microcontroller.



Fig 1. LPC 1114 Microcontroller [6]

**GSM SIM 900 Modem:** This is an ultra compact and a reliable module. This is a dual-band GSM/GPRS solution which can be embedded in the customer application. The message sent via mobile is stored in this GSM modem. This is used for the long distance communication purposes.



Fig 2. SIM 900 GSM Modem [7]

- **LED display panel:** This board consists of 16\*32 LED's which are soldered 50mm from one another. These kinds of boards are portable and customer friendly. LED is a flat display which uses an array of light emitting diodes to display notices. These provide adequate illumination in the public places where necessary.

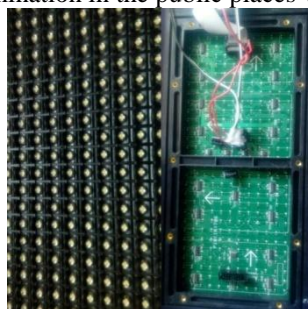


Fig 3. Front and back view of LED panel

- **Power Supply Unit:** A power supply unit is a electronic device which supplies electric power to the electrical devices. It gives 5V, 5A of supply to the entire kit. This power supply is used to maintain the longer life of the LED's. All power supplies have a power input, which receives energy from the source and delivers to the load output. This unit step downs the voltage and hence rectifies the AC power to DC power. The capacitors are used for the filter purposes.



Fig 4. Power supply unit [8]

- **Shift Registers:** The shift registers are functioned so as to shift the characters one by one on the display board.
- **Crystal Oscillator 12MHz:** The crystal oscillator is used in order to maintain the baud rate of 96004 for serial communication. Also the higher value of crystal oscillator is necessary to reduce the visible fading on the display board.
- **7805 Voltage Regulator:** Voltage regulator is used in order to have the constant voltage level.
- **MAX 232 Level Converter:** It converts the serial signal into RS232 signal. It also acts as the interface between the modem and the microcontroller.

Other components like Diodes, Registers, and Capacitors are also used.

#### IV. BLOCK DIAGRAM

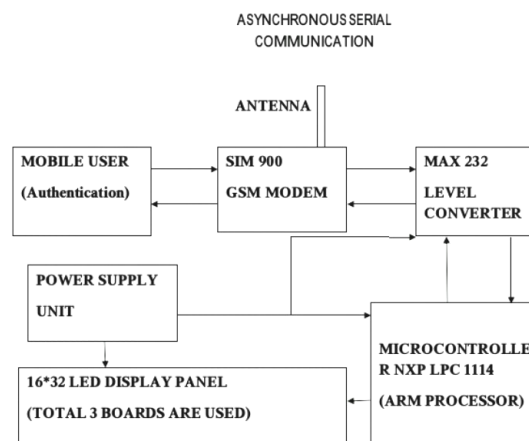


Fig 5. Block diagram of the System

#### A.WORKING

The paper explains a simple implementation between a mobile and a display board. The LED panel where the message is displayed accommodates 16\*32 LED's which are soldered at 50mm from each other.

The basic model consists of following equipments:

- Microcontroller LPC 1114
- SIM 900 GSM Modem
- MAX 232 Level Converter
- LED display Panel
- 5V Power supply

Below figure shows the experimental setup of the system;

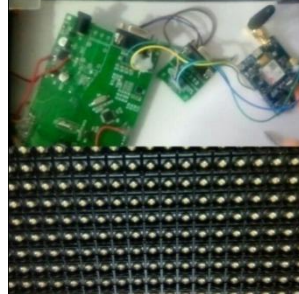


Fig 6. Hardware kit of the proposed system

The main supply is stepped down to 5V supply and then it is rectified from AC power to DC power by means of a simple Bridge rectifier. The harmonics are removed with the capacitor which is connected in parallel to the system. The pure DC supply is given to the overall model which is of 5V, 5A DC supply.

The working of the model is as simple as that where the user uses a simple GSM mobile to send a message. The sent message is stored in the SIM 900 GSM modem. This GSM modem is used for the communication purposes. The stored message is picked up by the Microcontroller by receiving proper Attention (AT) command. While the Microcontroller stores the message for some duration of about 20 second (by experimental results) then it is displayed on the notice board serially.

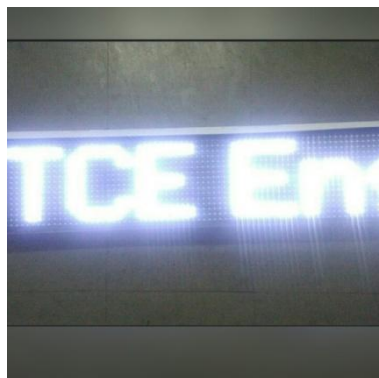


Fig 7. Experimental view of system

As shown in the block diagram the RS232 level converter is used in order to convert the signals to proper signals. The entire system is maintained at a baud rate of 96004 by means of using 12MHz crystal oscillators. At the back of the LED panel the LED's are soldered at a distance of 50mm from each other. Shift registers are used so as to scroll the message character wise.

The MAX 232 converter gives the controller input signal to the display board to display one character. Similarly by giving several control signals more number of characters is displayed. This reduces the time taken for displaying notice manually as they are taking place nowadays. As the communication is wireless, the message can be sent from any distance. The minimum characters displayed are 160 per board. Only authorized persons are meant to use such kind of boards in order to avoid misuse by other persons.

#### **B.ADVANTAGES**

- User friendly devices, can be installed in any of the public places.
- Cost is less compared to other software devices.
- Time consuming process.
- Quick response can be obtained.
- Reduces manpower.
- Message can be sent from any distant places.



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## C.DISADVANTAGES

- Only a minimum of 160 characters can be displayed in one message.

## D.APPLICATIONS

- Medical fields
- Railway stations and bus stands.
- Educational Institutions.
- Any other public places where exchange of notices is very important.
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## V. CONCLUSION

The main aim of this project work is to overcome the problems faced by the several people in public places like educational institutes, medical fields, railway stations and bus stands. This project reduces paper work and human effort and rapid information can be displayed. Local language can be added as a variation in this project. This can be achieved by using proper graphics and decoding techniques. Cost of printing and photocopying is also reduced as the information is given to the public faster at our fingertips.

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